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SOME NEOTROPICAL ANTHIDIINAE: *PARANTHIDIUM*, *ANTHIDIELLUM*, AND *HYPANTHIDIUM*

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In this paper are included certain other subdivisions of the Anthidiinae not considered in a previous issue of Novitates. The report is based on specimens kindly loaned by the British Museum, the National Museum, and by Dr. Joseph Bequaert, as well as on specimens in the collection of the American Museum.

To Miss Grace Sandhouse of the U. S. National Museum and to Mr. Robert B. Benson of the British Museum I am indebted for their kindness in interpreting for me certain of the types in their respective museums, and to Dr. V. S. L. Pate for comparing specimens of *auricolle* Friese with Cresson's type of *apicale*.

Paranthidium gabbii (Cresson)

One female collected at Geronimo, Guatemala, by Champion.

Paranthidium jugatorum (Cresson)

Six females, Mexico City (received from A. C. Baker). The specimens (National Museum and American Museum) were taken "in trap with turpentine."

Paranthidum macrurum (Cockerell)

Dianthidium macrurum COCKERELL, 1913, Annals and Mag. Nat. Hist., (8) XII, p. 107, male; 1914, Proc. U. S. Nat. Mus., XLVII, p. 92.

FEMALE.—Rust-red to nearly blood-red, with a minimum of black and yellow. Head with large, deep, coarse punctures that are dense but not confluent, the narrow intervening spaces and the depths of the punctures themselves covered with a microscopic tessellation that is most readily traced in the black areas on the front and in the supraclypeal region. Two rounded ridges or swellings that are inslanting below, between the antennae, a little less densely punctate on their summit than on their side. The mandibles long and overlapping, relatively slender at the base but with a broad, back-slanting apical edge of rather unbroken contour, there being only a slight irregularity in the surface between the fairly prominent outer tooth and the inner angle.[1]

[1]It is hard to say to what extent this linear contour may be due to wear. Slight irregularities are present on the apical edge of the mandibles of specimens of *Paranthidium jugatorium* and *lepidum*, which mandibles are otherwise very similar to those of *macrurum*. In a fresh specimen of *Paranthidium perpictum* the mandibles are obtusely quadridentate.

This long, rather regular, apical edge is not much shorter than the interior edge, giving the mandible almost the proportions of a low isosceles triangle of which the outer edge is the base. The clypeus quadridentate to quinquedentate along the middle of its apex, rounded and semitransparent on each side of the apex. The five basal segments of the antennae and the base of the sixth orange-colored to red, the segments beyond coal-black both above and below. The four orange-colored basal segments of the flagellum shorter than the black ones. The head rust-red except for a slight infusion of yellow at the lower end of the broad, heavy, rust-red bands along the inner orbits of the eye, and black on the following parts: apex and basal prominences of mandibles, teeth at apex of clypeus, and an area of irregular outline, rather parallel-sided below, broader and more or less rounded above, extending from the upper edge of the clypeus to include the ocelli. In this black area, however, are two rust-red maculations; one linear, extending downward from the anterior ocellus, and the other spear-shaped to quadrate, occupying the space between the interantennal ridges or swellings. These two maculations are virtually united, suggesting a spear or hammer and its shaft.

The mesonotum with punctures similar to those on the head; rather larger punctures on the mesopleura and scutellum. The tegulae densely covered with considerably smaller punctures. The propodeum densely, distinctly, and rather finely punctate-tessellate over its entire surface. The tubercles scalelike, slightly upturned along their anterior half and covered except on their anterior edge with blotchy, large but vague punctures. The scutellum subtriangular in shape, rather straight-sided and with a short posterior end that is almost truncate (but wholly different in appearance from the scutellum of Anthidiinae that have been assigned to *Pachyanthidium* and *Anthidiellum*). The following parts are rust-red to blood-red: mesonotum (entirely so in one specimen; with L-shaped figures of deep-orange hue in the anterolateral angles of the other); the mesopleura (almost wholly so in the first specimen, on their upper half in the second); the axillae and scutellum; the tubercles and tegulae; the upper half of the metapleura (in the first specimen).

The coxae mostly black and the trochanters with some black discoloration in the red (especially marked in the second specimen); the femora and tibiae largely rust-red, with a splash of black on the under side of the hind femora of the second specimen and black at the apex of the hind tibiae of both specimens; there is a splash of black, too, at the base of the otherwise largely rust-red hind basitarsi; the fore and middle basitarsi as well as the other tarsal joints largely dull, pale yellowish, and a faint, pale yellow streak at the base also of all the tibiae (barely traceable in the second specimen).

The wings of rather dark brown stain, with brownish venation. The stigma orange-colored. The marginal cell without an appendix at the apex. The second submarginal cell considerably longer than the first submarginal cell. The second recurrent vein extends only slightly beyond the second transverse cubital vein[1]; the first recurrent vein extends a considerable distance beyond the first transverse cubital vein.

The tergites of the abdomen rust-red (their apices rather darker) with a suboval yellow maculation on each side of the first five tergites of the first specimen (in the second specimen these yellow maculations are submerged in the prevailing rust-red). The punctation of the abdomen is large and coarse, with evidences of superimposed

[1]Cockerell in describing the male of *D. macrurum* found the "second r. n. going well beyond second s. m."

tessellation. The apical rims of the tergites are brown and smooth. On the venter there is black on the bases of the sternites even when the apices are rust-red.

The ventral scopa is silvery to ochraceous at the base but becomes increasingly yellowish as the apex is approached, being reddish golden on the last sternite. Yellow to golden, too, are the much shorter hairs on the face, vertex, thorax above, over most of the legs, and on the tergites of the abdomen. The hairs are silvery gray on the anterior part of the cheeks, on the pleura and abdomen beneath, and on the coxae, especially those of the hind pair of legs.

Length, 9½ to 11 mm.; width of thorax, 3½ to 4 mm.; length of forewing, including tegula, 10 to 11 mm.

The first specimen, which I designate the allotype (British Museum), was collected by H. H. Smith at Venta de Zopilote, Guerrero, Mexico, at an elevation of 2800 feet; the second (American Museum) was also collected by Smith at R. Papagaio, Guerrero, at an elevation of 1200 feet.

In spite of slight differences of detail (the most serious being that referring to the distance by which the second recurrent nervure extends beyond the second transverse cubital vein) these insects accord in so many essentials with what Cockerell has described on the basis of the male as *macrurum* that I feel reasonably certain they are the hitherto undescribed female of that species.

The ridges converging below between the antennae and the rather distinctive mandibles are structures worthy of emphasis. The interantennal ridges are not so sharply carinate as in some *Hypanthidium;* rather do these ridges resemble the similar structures in *Paranthidium texanum.* The mandibles are very like those of *Paranthidium jugatorium, Paranthidium lepidum,* etc. Judging from Cockerell's description of the pygidium of the male, that structure must closely resemble, if indeed it is not identical with, the pygidium of *Paranthidium arizonicum* and *Paranthidium texanum.* I have compared the females here described with a female of *texanum* and find the structural resemblance very close. They accord with *texanum* in the shape and sculpturing of the head, approximately in the dentition of the apex of the clypeus, in the character of the interantennal ridges, and the relationship of the joints of the antennae. The thoracic structure is the same for both species even to the inclusion of the rather triangular scutellum with its briefly truncated apex, the punctate-tessellate sculpturing of the propodeum, and the dense but rather fine punctation of the tegulae. The abdominal punctures seem to me rather less dense in *texanum,* but the different color of the tergites tends to make accurate comparison of the punctures difficult. Curiously enough, the second recurrent nervure is in the specimen of *texanum* rather farther beyond the second transverse cubital than is the

case in the females of *macrurum*, and this character may be a variable one. I suspect variability may occur, too, in the degree of recession of the apical edge of the mandible, for while the mandible of the female specimen of *texanum* is similar in character to that of *macrurum*, its apical edge is somewhat more abbreviated.

Anthidiellum robertsoni (Cockerell)

Two females and one male, all collected by H. H. Smith: one of the females at Soledad, Guerrero, Mexico, at an elevation of 5500 feet, in July, the other female at Rincon, Guerrero, at an elevation of 2800 feet, in September, the male at Cuernavaca, Morelos, Mexico, in June. Two of the specimens (a male and a female) are in the British Museum; the second female is in the collection of the American Museum.

Anthidiellum toltecum (Cresson)

Three males, all collected at Atoyac, Vera Cruz, Mexico, by H. H. Smith, in April and May. Two of the specimens are in the British Museum; the third specimen is in the American Museum.

Anthidiellum apicale (Cresson) and **Anthidiellum auricolle** (Friese)

Anthidium apicale CRESSON, 1878, Trans. Amer. Ent. Soc., VII, p. 116. FRIESE, 1911, 'Das Tierreich,' 28. Lieferung, pp. 391, 393–394.

Dianthidium apicale, COCKERELL, 1904, Ann. Mag. Nat. Hist., (7) XIV, p. 206; 1904, Bull. Southern Calif. Acad. Sci., III, p. 6; 1914, Proc. U. S. Nat. Mus., XLVII, p. 91.

It would seem that *Anthidiellum auricolle* (Friese), described from Costa Rica, is structurally the same insect that Cresson had previously described from Mexico as *apicale*. An *Anthidiellum* male taken by Dr. Bequaert at Zacapa, Guatemala, on May 9, 1931, which agrees with a specimen from San Mateo identified by Friese as his *auricolle*, first made me suspicious that *apicale* and *auricolle*, rather contiguous in their range, might be the same. Dr. V. S. L. Pate, to whom I entrusted Friese's specimens, male and female, of *auricolle*, very kindly compared them with Cresson's type material of *apicale*. He has written me as follows:

I compared your specimens of *auricolle* Fr. with those of *apicale* Cr. and found them to all intents and purposes identical, particularly the males. I was unable to get time to relax the types and compare the mandibles. The legs were drawn up rather tightly under the body and likewise a bit difficult to see but in both species appeared the same. The extent of the maculation of the faces of the males differs slightly but not enough to make any real difference. The thoracic and propodeal structure is the same and the structure of the posterior abdominal segments, particularly in the male, is likewise the same. Finally the punctation is similar throughout.

Subsequently I had a chance myself to confirm Dr. Pate's diagnosis. Cresson's male of *apicale* has merely a basal spot on the first tibiae while in Friese's *auricolle* before me the whole joint is exteriorly yellow ("yellow striped" according to Friese's description), but structurally the insects seem to be the same.

Anthidiellum apicale is fairly closely related to *Anthidiellum perplexum* (Smith) from our southeastern states. Tergite 7 is rather broadly rounded and the lateral apical corners of tergites 3–6 are lobate in the males of both of these insects, but the punctation of the abdominal tergites—especially the basal ones—is much denser and less coarse in *apicale* than is the case in *perplexum*.

Hypanthidium mexicanum (Cresson)

Three females, all collected by H. H. Smith, two of them at Atoyac, Vera Cruz, Mexico, in April, the third at R. Papagaio, Guerrero, at an elevation of 1200 feet, in October. Two of the specimens are in the British Museum; the third is in the American Museum.

Hypanthidium taboganum (Cockerell)

One female, collected by W. M. Wheeler, at Ancon, Canal Zone, on July 17, 1924. The specimen is in the British Museum.

Hypanthidium aureocinctum subspecies **parapanamense**, new subspecies

MALE.—The mandibles tridentate, the outermost tooth acute and long, the other two teeth considerably shorter, the innermost one broader but no longer than the median one. Two carinae converging below in the space between the antennae. The eyes strongly convergent below. The malar space obsolete. The head, like the thorax, densely punctured. The punctures largest on the anterior two-thirds of the mesopleura; the posterior one-third of the mesopleura mostly smooth but with diminutive punctures toward the apex. The tubercles carinate above, not scalelike. The scutellum faintly emarginate at its middle posteriorly. Base of metathorax with a series of large, deep pits, the thoracic truncation finely tessellate-punctate over most of its surface. The abdominal tergites much more finely punctate than the head and thorax, and the apex of each tergite more finely punctate than its base. The apical rim of tergite 6 abruptly produced toward the middle, the resulting process occupying in width a little more than a third of the tergite, truncate in shape but terminating at each of its lateral extremities in a rather flat but well-defined tooth. Tergite 7 bilobed on its apical half, each of the lobes being subequal to the rather deep intervening emargination.

The head is black with the following parts chrome-yellow: mandibles except teeth; clypeus except narrow, ferruginous, apical edge; moderately broad stripes, tapering upward along inner orbits of the eyes, terminating at about the level of the anterior ocellus; an interrupted U-shaped figure in the supraclypeal area, the arms of

the U almost coextensive with the interantennal ridges; a continuous band encircling the back of the head; a faint yellow stripe on the light ferruginous scape, the flagellum being of a somewhat sooty ferruginous.

The thorax is black with the following areas chrome-yellow: a spot of variable size on the mesopleura; a specklike maculation near the outer edge of the tegulae; two inverted L-shaped figures on the mesonotum, the long arm of the L along the lateral margin and the shorter arm part way along the anterior margin of the mesonotum, with the brief completing element of the L represented by a stunted discal stripe; a broad stripe on the axillae that is confluent with a narrower stripe rimming the scutellum posteriorly.

The legs black with the following exceptions: yellow spots on the anterior and on the posterior pair of coxae; a yellow stripe on the under side of the anterior femora and sometimes also on the under side of the middle and posterior femora; a ferruginous stripe on the upper side of all the femora; the front tibiae almost wholly ferruginous with an ill-defined, yellowish stripe on their upper side; the middle anteriorly broadly ferruginous invaded by yellow, posteriorly narrowly black; the hind tibiae black, with a vague, small, reddish maculation at the base and a stronger, yellowish maculation at the apex; the basitarsi externally yellowish, those of the middle and hind legs narrowly striped with black posteriorly; the other tarsal joints prevailingly ferruginous but more or less invaded by black, with sooty effect on those of the middle and posterior pair of legs. The tarsal claws without pulvilli.

The abdomen predominantly chrome-yellow but with the following exceptions: on tergite 1 the concavity at the base and a broad area at the apex black; on tergite 2 an area at the base and a broader area at the apex black; on tergite 3 a very narrow area at the base and a reduced area at the apex black; on tergite 4 only the apex rather narrowly dark and with more red than black; on tergite 5 the apex mostly clear ferruginous; on tergite 6 the median prolongation of the rim black, the narrow, unextended part of the rim dull ferruginous; tergite 7 in one specimen with a slightly darkened rim, in the other specimen the rim is hyaline.

The hairs pale and relatively short on the under side and sides of the thorax; long, fairly dense, and pale on the under side of the abdomen; the hairs on the face and dorsal surface of the body pale or somewhat golden. The legs with hairs partly pale, partly golden.

The wings dusky, especially so in the costal region; the first recurrent nervure goes well beyond the first transverse cubital, and the second recurrent nervure is an approximately equal distance beyond the second transverse cubital. There is a small appendix at the lower extremity of the apex of the marginal cell. The venation is brownish; the stigma and the tegulae are orange-colored.

Length, 6½ mm.; width of thorax, 2½ mm.; length of forewing, including tegula, 6½ mm.

FEMALE.—Structurally differentiated from the male as follows: the mandibles quadridentate but with only the two teeth near the outer edge conspicuous and close together, the two teeth toward the inner edge more widely separated and sometimes worn low, giving in such cases the impression of an unbroken cutting edge. The process on the apex of the penultimate tergite of the male utterly lacking in the female, and the apical tergite simple, of uninterrupted, rounded outline.

The maculations very similar to those of the male, differing only as follows: the mandibles more extensively black at the apex; yellow stripes on the under side of all

of the femora in all of the specimens; the yellow stripe that in the male is superimposed on the ferruginous front tibiae lacking; the posterior area of black on the middle tibiae more extensive and the maculation at the apex of the hind tibiae lacking; the basitarsi black and the other tarsal joints darker than in the male, for the most part or wholly black instead of ferruginous. Tergites 1–5 are as described for the male, even in respect to having red replace black on the apex of tergites 4–5; tergite 6 is wholly yellow except for a very narrow margin of black rimming the apex.

The hairs in general like those of the male, distinctly golden on the face and dorsal surface of the body.

Length, 6 to 6½ mm.; width of thorax, 2¼ mm.; length of forewing, including tegula, 6 mm.

I was at first inclined to believe this insect distinct from *aureocinctum* because of the allusion in the description of *aureocinctum* to the malar space as yellow, whereas in the insect here described there is no malar space, this being "obsolete" as in Cockerell's *panamense*. Through Mr. Robert B. Benson of the British Museum, who kindly compared a female of *parapanamense* that I sent him with the type of *aureocinctum*, I am informed, however, that while there are differences of coloration between *aureocinctum* and *parapanamense*, structurally he can find very little difference between the two. In *aureocinctum* as in *panamense* and *parapanamense* the malar space is obsolete. Mr. Benson was kind enough to send me a specimen identified by the British Museum as *aureocinctum*. It is one of three specimens from the collection of Godman and Salvin, being taken at Teapa, State of Tabasco, Mexico. Mr. Benson states that the markings on the abdomen of this specimen are "considerably paler than in the type" of *aureocinctum*. Indeed the prevalence of red and yellow on the abdomen of this specimen to the near exclusion of black, verges on the condition present in the also structurally similar *panamense*, and suggests the likelihood of an intergrading and possibly overlapping series of forms throughout Central America in which one extreme is the highly ornamented *panamense* and the other, perhaps, the rather melanistic form *parapanamense*.

Structurally hard to separate from *aureocinctum* and *panamense*, the subspecies *parapanamense* differs superficially from *aureocinctum* in its somewhat more melanistic tendencies, the discal stripes on the mesothorax being merely stumplike, the legs having much black in addition to the merely yellow and red mentioned in the description of *aureocinctum*,[1] and several of the abdominal tergites being apically black instead of "broadly ferruginous."

Structurally the male is virtually identical with what I have

[1]In the specimen from Teapa identified as *aureocinctum* the legs are wholly yellow and reddish except for the somewhat black anterior trochanters.

interpreted as the male of *panamense* (1927, Amer. Mus. Novitates, No. 253, p. 17). The female of *parapanamense*, too, seems to accord structurally with the corresponding sex of *panamense*. What at first appeared sharply to differentiate the one female from the other was the quadridentate mandible of *parapanamense* as against the bidentate mandible instanced in the original description of *panamense*. Miss Grace Sandhouse of the U. S. National Museum, who kindly relaxed the type specimen of *panamense* in order the better to examine the mandible, has written me, however, as follows: "There are, as you suspected, four teeth, arranged as you described them[1] [in your letter]." This seems to remove doubt as to the essential accord structurally of *panamense* and of *parapanamense* not only in the male but also in the female.

The above descriptions are based on five specimens, two males and three females all collected during February–March, 1931, by J. Bequaert, at Santa Emilia Pochuta, Guatemala, at an elevation of 1000 feet. The holotype, allotype, and one paratype have been deposited by Dr. Bequaert in the Museum of Comparative Zoölogy of Harvard University; the other two paratypes, male and female, are in the American Museum. The allotype was collected at the flowers of *Baccharis trinervis*. The identification of the plant was made by Mr. Standley from specimens collected by Dr. Bequaert.

HYPANTHIDIUM

(Mexican and Central American forms only)

MALES

[Except *bilobatum* Friese[2] and *aureocinctum* Cockerell (male unknown) and *melanopterum* Cockerell (male unknown).]

[1]Of the four teeth the two at the outer edge are close together and conspicuous, the two toward the inner edge are more widely separated, the fourth tooth constituting indeed the angle of the inner edge.

[2]Friese based his description of *bilobatum* (which is evidently in its structure rather like *aureocinctum*, *panamense*, and *parapanamense*) on specimens from such widely sundered regions as South Brazil and Paraguay, on the one hand, and San José, Costa Rica, on the other. His description indicates a range of variability in the maculations of the abdomen at least, but it is not clear whether the specimens from San José belong to one extreme or the other, are intermediate between the two, or cover both extremes. The description of both *aureocinctum* and *panamense* antedate *bilobatum:* accordingly, if distinctions of maculation be disregarded, *bilobatum* would take rank probably only as a synonym of *aureocinctum* or of one of the South American forms.

Judging from the description, the Brazilian *flavo-pictum* Smith (the type of which is a male with the apical tergite "quadrate, deeply notched in the middle, the notch rounded") is of the general character of the males of *aureocinctum*, *panamense*, *bilobatum*, and *parapanamense*. Ducke (1910, Revue d'Entomologie, Caen, XXVIII, p. 102) makes *flavo-pictum* a synonym of *guttatum* Latreille, described from the female, and likewise makes *flavomarginatum* Smith and *elegantulum* Smith synonyms of Latreille's species. If my interpretation of *flavo-pictum* is correct, it would seem that at least *flavomarginatum*, which was described from the male, cannot be considered identical with *flavo-pictum* and hence cannot be made a synonym of *guttatum*, for *flavomarginatum* according to Smith has on tergite 7 "a small, deep impression in the middle, close to the apical margin," which alligns it rather with such forms as *mexicanum*, described a year in advance of *flavomarginatum*, and *taboganum*. Schrottky's *flavomarginatum* subsp. *obscurior*, with its tergite 7 described as "ferrugineo basi nigra latissime bilobata" seems rather to be a subspecies of *flavo-pictum*. Schrottky's *flavofasciatum*, the female of which has two small, longitudinal stripes between the antennae, seems to belong to the *flavo-pictum* branch of *Hypanthidium*.

[Later]. Since the above paragraph was written, Mr. Robert B. Benson has been kind enough to examine the types of *flavo-pictum* and *elegantulum* in the British Museum and has written me as follows: "*Anthidium elegantulum* Smith is probably the female of *flavo-pictum* Smith as you suggest. The female *elegantulum* has got the two converging carinae in the interantennal space. The male type of *flavo-pictum* has tergite 7 bilobed as you indicate and tergite 6 is produced in the way you speak of (produced and broadly truncate along the middle of its apex)."

1.—Tergite 6 produced broadly and truncately along the middle of its apex. Tergite 7 with its apex bilobed.....2.
Tergite 6 simple. Tergite 7 with its apical margin hyaline and entire, but with a pitlike depression medianly.....3.
2.—The legs and abdomen clear ferruginous and yellow.....*panamense.*
The legs variegated with black and several of the basal tergites of the abdomen black banded with yellow.....*parapanamense.*
3.—Tergite 1 maculated.....4.
Tergite 1 immaculate.....*taboganum.*
4.—Tergite 2 immaculate.....*mexicanum.*
Tergite 2 laterally maculated.....*costaricensis.*[1]

FEMALES[2]

1.—Two apically converging carinae in the region between the antennae. Clypeus yellow except for the anterior edge.....2.
The region between the antennae without carinae.....4.
2.—Legs yellow with ferruginous or reddish.....3.
Femora black, striped with yellow below and with ferruginous above; middle tibiae black posteriorly; hind tibiae black except for a basal spot; basitarsi and other tarsal joints mostly black.....*parapanamense.*
3.—The tergites black at the base, broadly ferruginous at the apex, each with a very broad, entire, chrome-yellow band.....*aureocinctum.*
The tergites red and yellow to the exclusion of black.....*panamense.*
4.—Tergite 1 black; tergite 2 with a maculation at each extremity.....*taboganum.*
Tergite 1 maculated.....5.
5.—Tergite 2 immaculate.....*mexicanum.*
Tergite 2 with a small mark on each side.....*melanopterum.*

[1]It is possible that *costaricensis* is the undescribed male of Cockerell's *melanopterum*, but, if so, the female type of *costaricensis* does not belong with the male allotype. Indeed, I find it difficult on the basis of the description to interpret the female of *costaricensis* as a *Hypanthidium* while I think the male is almost certainly of this group. Friese's type material of *costaricensis* included not only specimens from San José, Costa Rica, but also from distant Paraguay. It may well, therefore, have been composite.

[2]I am indebted to Miss Grace Sandhouse, of the U. S. National Museum, who kindly examined at my request the type material of *H. melanopterum*, *H. panamense*, and *H. taboganum*, for aid in preparing this key.